C.U.SHAH UNIVERSITY **Summer Examination-2022**

Subject Name: High Voltage Engineering

	Subject Code: 4TE06HVE1		TE06HVE1	Branch: B.Tech (Electrical)					
	Semest	er: 6	Date: 05/05/2022	Time: 02:30 To 05:30	Marks: 70				
	(1) (2) (3)	 structions: (1) Use of Programmable calculator & any other electronic instrument is prohibited. (2) Instructions written on main answer book are strictly to be obeyed. (3) Draw neat diagrams and figures (if necessary) at right places. (4) Assume suitable data if needed. 							
Q-1		Attem	pt the following questions:			(14)			
	a)	a) b) c)	high mechanical strength high resistance to thermal det high dielectric loss			(1)			
	b)	Pasche a) b) c)	Free from gaseous inclusions en's law is associated with ionization breakdown voltage thermal radiations			(1)			
	c)	The br a) b) c)	None of the above eakdown strength of mineral of 20KV/mm 50 KV/mm 3 to 5 KV/mm All of above	oil is about		(1)			
	d)	Electri a) b) c)	cal Conduction in a gas was fi Loeb Maxwell Townsend None of above	rst studied in 1905 by		(1)			
	e)	Intrins a) b) c)	ic breakdown occurs in time o 10-5 s 105 s 10-8 s 108 s	f the order of		(1)			
	f)	a) b) c)	se voltages are characterized b polarity peak value time of half the peak value all of the above.	у		(1)			



	g)	 According to the Stressed Oil Volume theory, the breakdown strength is a) Directly proportional to the stressed oil volume b) Directly proportional to the square of the stressed oil volume c) Inversely proportional to the stressed oil volume 	(1)
		d) None of these.	
	h)	Write application of high voltage engineering.	(1)
	i)	Draw circuit of voltage doubler.	(1)
	j)	Define internal discharge in solid breakdown.	(1)
	k)	List various gases used for gases breakdown.	(1)
	l)	Write properties of liquid di-electrical.	(1)
	m)	Write advantages of high voltage.	(1)
	n)	Define impulse wave.	(1)
Attem	pt any	four questions from Q-2 to Q-8	
Q-2		Attempt all questions	(14)
C	(a)	Explain liquid purification system with test cell.	(07)
	(b)	Write short note on following:	(07)
		(1) Intrinsic breakdown (2) Electromechanical breakdown.	
Q-3		Attempt all questions	(14)
	(a)	Define the Townsend first & second ionization co-efficient. Also derive the	(07)
		equation for second ionization co-efficient I = $IOe^{\alpha d} / (1-\gamma (e^{\alpha d} - 1))$.	
	(b)	Draw neat and clean diagram and explain Paschen's laws.	(07)
Q-4		Attempt all questions	(14)
	(a)	Write short note on following :	(07)
		(1) Stress oil volume theory (2) Bubble theory.	
	(b)	Explain treeing and tracking effect in soild breakdown.	(07)
Q-5		Attempt all questions	(14)
	(a)	Explain in brief Van de Graff generator for generation of high voltage dc.	(07)
	(b)	Why a Cockcroft – Walton circuit preferred for voltage multiplier circuits?	(07)
		Explain its working with a schematic diagram.	
Q-6		Attempt all questions	(14)
	(a)	Draw and explain deltatron circuits.	(07)
	(b)	Briefly explain cascade transformer with neat and clean diagram.	(07)
Q-7		Attempt all questions	(14)
-	(a)	Explain measurement of ac, dc and impulse voltage measurement with sphere gap	(07)
		arrangement.	
	(b)	Write short note on generating voltmeter.	(07)
Q-8		Attempt all questions	(14)
	(a)	Write short note on testing of transformer.	(07)
	(b)	Explain measurement of capacitance with Schering bridge.	(07)

